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EXAMINER

AGGARWAL, YOGESH K

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2622

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Response to Arguments

1. Applicant's arguments with respect to claims 1 and 4 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leitz (US Patent # 4,071,297) in view of Mimura et al. (US Patent # 6,927,792).

[Claim 1]

Leitz teaches an image pickup apparatus (figure 7), comprising: a plurality of pixels (5r, 5r', 5g and 5g') each including a first sensitive area and a second sensitive areas (photoelectric portions 5g and 5g' are considered one pixel pair and photoelectric portions 5r and 5r' is considered another pixel pair, col. 4 lines 40-44), wherein the first and second sensitive areas receive light flux respectively corresponding to different areas of an exit pupil of an imaging optical system (1, See figure 7) wherein two photoelectric conversion portions (e.g. 5g and 5g') are formed in each of the plurality of pixels based on the first and second sensitive areas,

an output unit (9' and 9'') that receives outputs a first electric signal and a second electric signal from each of the plurality of pixels and that detects and outputs a phase difference between corresponding first electric signal and the second electric signals from each of the plurality of pixels (col. 4 lines 53-60),

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wherein the first and second sensitive areas of each of the plurality of pixels are arranged so that corresponding first and second electric signals, received by the output unit, each includes signals generated in the first and second sensitive areas of a corresponding one of the plurality of pixels (col. 4 lines 44-col. 5 line 10).

Leitz fails to teach wherein a sensitivity distribution of the first sensitive area and a sensitivity distribution of the second sensitive area partially overlap. However Merrill discloses an image pickup apparatus comprising (figure 1) an arrangement of a plurality of pixel units each including a first photoelectric conversion unit (photodiode, 12) and a second photoelectric conversion unit (photodiode 14) wherein each of the pixel units includes a sensitivity region where a first sensitivity distribution (represented by a curve A) by said first photoelectric conversion unit (12) and a second sensitivity distribution (represented by a curve B) by said second photoelectric conversion unit overlap (col. 4 lines 27-44, figure 2). Therefore taking the combined teachings of Leitz and Merrill, it would be obvious to one skilled in the art at the time of the invention to have been motivated to have each of the pixel units includes a sensitivity region where a first sensitivity distribution by said first photoelectric conversion unit and a second sensitivity distribution by said second photoelectric conversion unit overlap in order to have a larger dynamic range thereby improving focusing in low light and high light levels (See Merrill, col. 1 lines 38-42 and col. 2 lines 8-11).

4. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Leitz (US Patent # 4,071,297), Mimura et al. (US Patent # 6,927,792) and in further view of Wu et al. (US Patent # 5,760,852).

[Claim 4]

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Leitz in view of Mimura teach the limitations of claim 1 but fails to teach wherein the first and sensitivity areas are formed on the basis of an F-number of the imaging optical system of a focus detection mode. However Wu et al. teaches that sensitivity of the CCD array (It is noted that the first and second sensitive areas of a pixel unit are included in a CCD array) can be adjusted by controlling electronic gain and the f-number of the objective lens (col. 7 lines 22-24). A focus detection mode would be inherently taught. Therefore taking the combined teachings of Leitz, Mimura and Wu, it would have been obvious to one skilled in the art at the time of the invention to have been motivated to have sensitivity region formed on the basis of an F-number of the imaging optical system of a focus detection mode in order to have a device that can be used in a wide variety of lighting conditions.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to YOGESH K. AGGARWAL whose telephone number is (571)272-7360. The examiner can normally be reached on M-F 9:00AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571)-272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Yogesh K Aggarwal/
Primary Examiner, Art Unit 2622